DOCUMENT RESUME

ED 253 758 CE 040 810

AUTHOR Galbraith, Gordon
TITLE Agriculture Cluster Brief. Vocational Education in Oregon.
INSTITUTION Oregon State Dept. of Education, Salem.
PUB DATE Nov 84
NOTE 19p.; For related documents, see CE 040 811-820.
PUB TYPE Guides - Non-Classroom Use (055)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Agricultural Education; Articulation (Education); Behavioral Objectives; *Course Content; Course Organization; *Criteria; Curriculum Development; *Educational Objectives; Educational Planning; Occupational Clusters; Program Descriptions; *Program Development; Program Improvement; Secondary Education; State Curriculum Guides; State Programs; *Statewide Planning; Vocational Education
IDENTIFIERS *Oregon

ABSTRACT

This guide sets forth minimum approval criteria for vocational agriculture cluster programs in Oregon. The agriculture cluster program includes instruction in six areas: animal science, soil science, plant science, agricultural economics, agriculture mechanics, and leadership development. The information in the guide is intended for use by district-level curriculum planners, teachers, regional coordinators or state education department staff involved with new program development or revisions of existing programs. The guide outlines the instructional content in terms of program descriptions, areas for training, program goals, course/content goals, and sample performance objectives. Course titles and descriptions are also included. A section on organizational options is designed to illustrate a few of the many ways to deliver the minimum instructional content required for an approved vocational cluster program. Content is illustrated by course titles for the instructional levels to recognize that students from different grades may enroll in one or more levels of a program. (KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED253758

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

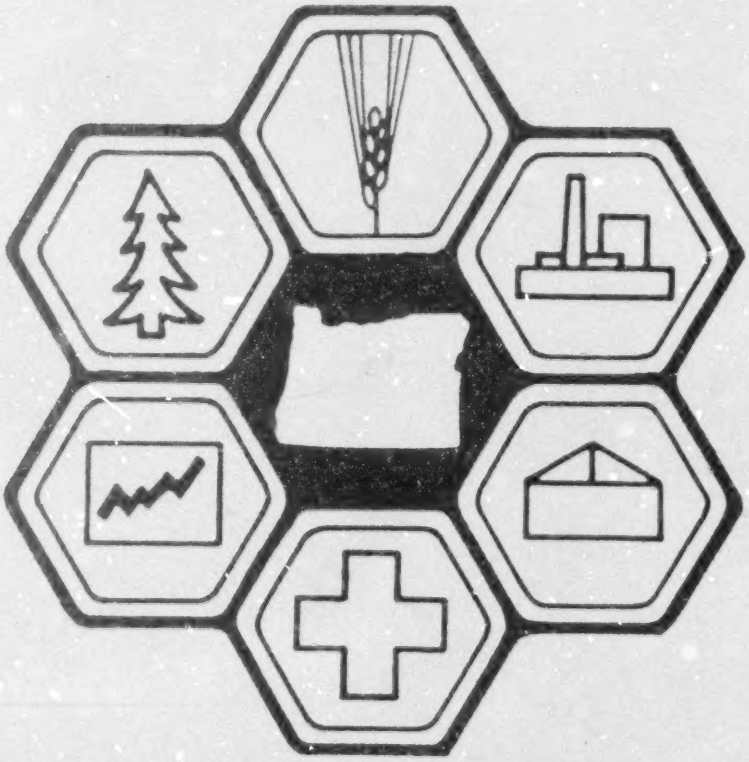
S J Case

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CLUSTER BRIEF

AGRICULTURE

November 1984



Vocational Education in Oregon

CE 040 210

OREGON DEPARTMENT OF EDUCATION
700 Pringle Parkway SE
Salem, OR 97310

Gordon Galbraith
(Specialist's Name)

378-3595
(Specialist's Phone Number)

AGRICULTURE VOCATIONAL CLUSTER PROGRAM
MINIMUM APPROVAL CRITERIA

The following information is for use by district-level curriculum planners, teachers, regional coordinators or Department staff involved with new program development or revisions of existing programs.

The minimum approval criteria for an Agriculture Cluster program are set forth in this document. The instructional content is outlined in terms of program descriptions, areas for training, program goals, course/content goals and sample performance objectives. Course titles and descriptions are also included.

The section on organizational options is designed to illustrate a few of the many ways to deliver the minimum instructional content required for an approved vocational cluster program. Please note that time is illustrated in terms of credits. Content is illustrated by course titles for the instructional level(s) to recognize that students from different grades may enroll in one or more levels of a program.

Program Description

The agriculture cluster program includes instruction in the following six areas: animal science, soil science, plant science, agricultural economics, agriculture mechanics and leadership development. The instructional program is designed for occupational preparation in production agriculture and off-farm agricultural occupations (agri-business). These occupations are grouped under the following categories: agriculture production, agriculture supplies, agriculture mechanics, agriculture processing, ornamental horticulture and forestry/agriculture resources. The secondary vocational agriculture program has three main components: the classroom/field/shop instruction; the vocational student organization, Future Farmers of America (FFA); and Supervised Occupational Experience Programs (SOEP). The classroom/field/shop instruction prepares students with the knowledge, skills and background information needed to begin working. The SOEP provides students with the "hands-on" experience of actually applying information and skills. The FFA

gives students tne opportunity to apply technical and leadership skills, gain recognition and provides a motivation tool for instruction.

Areas for Training

Examples of agricultural occupations included in the agriculture cluster:

Agricultural Production
1. Farm or ranch owner
2. Farm or ranch manager or operator
3. Farm worker (year round)

Agricultural Mechanics
1. Agricultural machinery dealer
2. Agricultural machinery manager
3. Agricultural machinery parts
4. Agricultural machinery service
5. Agricultural machinery mechanic
6. Agricultural machinery sales
7. Custom farm machine operator

Ornamental Horticulture
1. Nursery operator
2. Greenhouse propagator
3. Garden center manager
4. Landscape designer
5. Greenskeeper
6. Nursery sales
7. City, state, or national park gardener
8. Tree surgeon
9. Florist
6. Nursery sales
7. City, state, or national park gardener

Agricultural Supplies
1. Elevator operator
2. Seed cleaner
3. Feed nutritionist
4. Seed analyst
5. Feed, seed, fertilizer service and/or sales

Agri-Products (Processing)
1. Livestock or poultry buyer
2. Fruit and vegetable service and/or sales
3. Fruit and vegetable inspector or grader
4. Grain sales
5. Livestock auction manager
6. Dairy products processing plant manager

Forestry/Agricultural Resources
1. Forestry technician or aide
2. Logger
3. Log grader
4. Log scaler
5. Timber cruiser
6. Wildlife technician
7. Range management technician
8. Soil conservation technician
9. Park naturalist

Program Goals

Students will be able to:

- Make tentative agriculture career choices based upon their abilities, aptitudes, interests and knowledge of production agriculture and agribusiness occupations.
- Demonstrate identified skills and knowledge needed by individuals engaged in or preparing to engage in production or agribusiness agricultural occupations.
- Demonstrate basic leadership and communication skills to fulfill occupational, social and civic responsibilities.
- Know and use safety practices in agricultural mechanics, livestock handling, pesticide and chemicals.
- Obtain satisfactory employment in an agricultural or agribusiness occupation.
- Apply science concepts and skills to animal, plant, soils and agricultural mechanics instruction.
- Apply mathematic concepts and skills to animal, plant, soils, agricultural mechanics and agriculture economics instruction.
- Understand and apply entrepreneurship skills to individual Supervised Occupational Experience projects and entry agriculture/agribusiness occupations.

<u>Course/Content Goals</u>

ANIMAL SCIENCE

Students will be able to:

Identify the important breeds of livestock in the community.

Identify the various body parts of animals.

Select livestock, dairy, and poultry in accordance with breeding and marketing standards.

Keep accurate production records.

Determine the nutrient requirements of various types of livestock, dairy and poultry found in the community.

Explain the information given on feed bag tags.

Design a balanced ration for a simple-stomached farm animal using local feeds and prices.

Design a balanced ration for a plural-stomached farm animal using local feeds and prices.

Trace a bite of roughage through the digestive tract of a ruminant explaining what happens to it during the process.

Use a chart for determining gestation and heat periods for farm animals.

Plan a livestock improvement program for a type of livestock in the community; specify breed, schedules for breeding, sire-dam ratio, culling program indicating standards.

Analyze progeny records for such things as:

1. Pounds of gain per pound of food
2. Average daily weight gain
3. Carcass yield and quality
4. Cost per pound of gain

Design a program to promote good health and safety of farm animals.

Give simple injections (inoculations, etc.) according to approved practices.

Treat parasite infestations.

Perform debeaking, castrating, docking, foot trimming, dehorning, clipping eye teeth and shearing operations, etc.

Prepare livestock, dairy, or poultry for exhibit at fairs and shows.

Plan a calendar of events for a specific class of livestock covering breeding, feeding and management during one production cycle.

Keep accurate production and financial records on a particular livestock enterprise.

Analyze the records to determine if his/her management practices were profitable.

Interpret market reports in newspaper and official reporting services.

Determine market grades of meat and poultry products sold.

Identify the major cuts of meat.

Compile a list of marketing agencies in the community, noting advantages and disadvantages of each.

Keep production records on livestock, summarize and analyze at end of the production cycle.

SOIL SCIENCE

Students will be able to:

Determine soil texture by feel.

Identify areas in soil profile.

Identify a plowpan, hardpan, and/or claypan.

Determine when a soil is ready to till.

Read a soil map.

Determine water-holding capacity of various soils.

Determine slope.

Determine land use and capability of typical soils in the community.

Test soil sample to determine acidity or alkalinity.

Make decisions concerning use of fertilizers and soil amendments based upon soil tests and crop produced.

Determine presence of organic matter in soils.

Determine conditions under which to use animal and green manures.

Read labels and analyze fertilizers on the market.

Compute the cost of fertilizing a crop using various materials purchased from local sources.

Plan a soil improvement program for a specific crop after having the soil tested and reviewing the recommendations.

Apply fertilizer to a crop using acceptable methods, recommended rates, and at the proper time.

Plan ways of draining a swampy area.

Operate farm level and surveying equipment.

Lay out a contour line after determining the slope of a field.

Irrigate and determine the frequency of irrigation for profitable crop production.

Analyze a soil survey made of the local farming area.

Make minor repairs and adjustments in an irrigation system.

Work with Soil Conservation Service in planning irrigation and drainage needs.

PLANT SCIENCE

Students will be able to:

Test a sample of seeds for germination and interpret results from the standpoint of good management practices.

Identify samples of plant material representing each type of reproductive process.

Identify plant parts and explain their function.

Identify common fertilizer materials used in the community.

Calculate application rates of fertilizer for a specific crop.

Apply fertilizer to a crop using recommended procedures.

Identify nutrient deficiency signs in crops.

Keep production record.

Propagate plants by seed and vegetatively.

Select high quality seed.

Select suitable plants for parent stock.

Identify the various stages in the life cycle of an insect.

Identify common noxious weeds in the community.

Fumigate a small plot using approved procedures.

Plan and carry out a rodent control program in the community, or on the home farm.

Determine correct applications and safety measures for a weed control program.

Analyze the practice of aerial spraying or dusting of crops in the community from the standpoint of cost per acre.

Compare the cost of various chemicals designed to accomplish the same purpose.

Interpret the meaning of labels found on chemical containers.

Prune shrubs or trees to remove damaged portion.

Know how to interpret the information found on labels of pesticide containers.

Plan a crop management program in the community for a major crop, from seedbed preparation to harvesting.

Select quality seed.

Prepare the seedbed, plant, and harvest a crop. (Land lab or supervised farming program)

Keep production records on a crop and summarize at end of production cycle.

Identify common horticultural plants found in the community.

Propagate plants using seed and various propagating media.

Propagate plants vegetatively by cutting, grafting, budding, and layering.

Transplant plants from seedling flats to growing-out containers.

Prepare a soil mix for use in the greenhouse.

Operate equipment used in a nursery, greenhouse, landscaping firm, or fruit or vegetable farm.

Prepare and plant a lawn. (Land lab or around school grounds or home.)

Outline a lawn maintenance program.

Sketch a simple plot plan.

Read a landscape plan and install prescribed plants.

Prune fruit and ornamental trees and shrubs.

Determine tree volume using abney level, clinometer, biltmore stick, and diameter tape.

Scale logs, using scale stick, tally sheet, spud, scaler's tape, and carpenter's tape.

Operate chain saw and other harvesting and thinning equipment.

Set up and use a staff compass and ready mapper to map out a farm woodland area.

Identify commercial trees in the local community.

Plant trees from seedlings using approved methods.

Set up an approved fire prevention program for a woodland area.

Determine slopes, using abney levels and/or clinometers.

Determine age and growth rates of trees, using the increment borer.

AGRICULTURE MECHANICS

Students will be able to:

Carry out a maintenance program on farm implements safely.

Plan and conduct a winterizing program for farm equipment.

Safely and properly operate the following equipment in the field: tractor, tillage implement, seeding or fertilizing implement, and harvesting implement.

Calibrate a grain drill, fertilizer spreader, weed sprayer or duster according to a recommended setting.

Recondition and return to proper working order one or more farm implements.

Make adjustment of tension on a hay baler under field conditions.

Select a pump for a home water or irrigation system.

Disassemble and assemble small gasoline engines to identify systems and major parts.

Make carburetion, governor, and ignition adjustments for proper operation of both fourand two-cycle engines and tractors.

Using a service manual, perform daily, weekly, monthly, semiannual, and annual maintenance on a farm tractor.

Develop accuracy in using micrometer, feeler gauge and other small automotive tools.

Store various fuels at home and at school safely.

Safely operate a tractor under various loads in both field and road conditions.

Prepare an engine or tractor for storage.

Adjust component parts of a tractor; i.e., brakes, carburetor, points.

Plan an electrical circuit showing location of switches, outlets, ground, fixtures, etc.

Install several electrical circuits for different appliances involving single-pole and three-pole switches, convenience outlets, grounds, and fixtures according to code requirements.

Replace switches, fuses, and outlets and repair extension cords.

Service an electric motor.

Select and install an electric motor with belt and pulleys.

Reverse the direction of an electric motor.

Read an electric meter and compute the monthly charges using local electric rates.

Identify common building materials, including lumber, nails, hardware items and fencing materials.

Figure a bill of materials and compute its cost from a farm building plan.

Plan and carry out a building maintenance and improvement program on student's home farm.

Cut rafters and braces for a small farm building.

Using a farm level, lay out a building foundation complete with batten boards.

Properly select and use both hand and power woodworking tools to erect a small farm building.

Sharpen various cutting tools such as a plane iron, auger bit, etc.

Lay out and erect a woven wire or barbed wire fence complete with anchor posts.

Select a paint or preservative, prepare the surface, and paint a home farm building.

Frame a small farm building.

Compute storage volumes of barns, silos, bins, and concrete jobs.

Properly care for and maintain the home disposal system.

Identify metal samples according to hardness, porosity, color and spark.

Select electrodes for various welding jobs.

Demonstrate proper welding technique for different kinds of welds from various welding positions, including hard surfacing.

Demonstrate the proper technique in using the oxyacetylene equipment in cutting, brazing, and mild steel welding.

Select a plan and construct a small metal project for use in the home, on the farm, or for the home shop.

Prepare, prime, and paint metal surfaces and properly care for paint equipment.

Demonstrate the proper care and use of the drill press, sanders, grinders, power hacksaw and the threading equipment.

Prepare several different types of joints and join them by soldering.

Plan, select, and fabricate farm and home equipment.

Select pipe, fittings, measure, mark, cut, ream and thread pipe.

Repair leaks and faucets.

Splice plastic pipe.

Identify and locate components of a hydraulic system.

Check and fill hydraulic oil.

Service oil filter.

Drain hydraulic system.

Couple remote hydraulic lines.

Select hydraulic remote cylinder according to needs.

Service power steering.

Determine availability of parts and services.

Shop for tractor financing.

Check for availability of accessories and implements.

Interpret Nebraska Test Reports as an aid in tractor selection.

LEADERSHIP DEVELOPMENT

Students will be able to:

Participate as an informed member of the FFA.

Participate in civic affairs as an informed member of the community.

Communicate with meaning and clarity.

Present and expand personal views logically and concisely to individuals or groups.

Plan, organize, write, deliver and evaluate a speech on an agricultural subject.

Evaluate communications and take appropriate action.

Properly use parliamentary procedure to participate in making a decision through use of motions and discussion.

Organize and develop an agenda for a business meeting.

Chair an orderly business meeting.

Accept responsibility and carry assignment through to completion.

Contribute to the function of a committee.

Use good personal habits in speech, manners, cleanliness and work.

Use basic etiquette for common occasions.

Use good personal conduct at all times.

Get along with others:

1. Maintain open lines of communication
2. Listen to the other person and try to understand his/her point of view
3. Give credit where credit is due
4. Admit mistakes
5. Accept other persons as they are, with their strengths and weaknesses

AGRICULTURE ECONOMICS

Students will be able to:

Keep accurate animal and crop production records.

Set up a system for keeping accurate breeding records.

Set up a machinery maintenance record system.

Estimate costs of production for an animal and a crop enterprise based upon local cost factors.

Plan and complete a record book for a supervised farming or work experience program.

Complete an income tax report based upon personal income received from wages and supervised occupational experience programs.

Develop a farm lease.

Establish a calendar of job operations for a given farm enterprise.

Prepare a budget for a farm enterprise.

Analyze several sample life, fire, automobile, property and liability insurance policies for protection guaranteed.

Determine social security payments and benefits derived from these payments.

Complete a federal and state income tax form.

Prepare an application form for a work permit and social security number.

Prepare a report on the proper way to file an application for unemployment compensation.

Compute property taxes on home farm from assessments made by the county assessor.

Compute depreciation.

Prepare a bill of sale for an agricultural product.

Correctly complete a standard lease form.

Write a check correctly and accurately make a cash transaction.

Interpret written contracts, and evaluate them on the basis of equitable rights and obligations.

Write an agreement on simple contracts.

Prepare the necessary forms to open a bank account.

Prepare a reconciliation of a bank statement.

Compute and compare the interest rates charged by various merchants and lending institutions in the community.

Fill out a loan application.

Identify forms of credit and possible lending agencies available to the farmer.

Evaluate an enterprise in terms of profit or loss.

Select a farm in the community, and by the use of established criteria, determine a fair price for the property.

Using a sample farm in the community, determine the possibilities of expanding the business. Consider all expansion factors.

Develop a crop rotation system.

Develop a budget for each supervised farming enterprise.

Determine crop and livestock efficiency.

Apply the decision-making process, using established budgeting criteria to the management decisions.

Identify those farm organizations active in the local community.

Complete forms for participation in various government programs.

Analyze the effectiveness of government programs in the community, (price supports, marketing orders, etc.).

Analyze the effectiveness of the government's cost-share program for conservation improvements.

Compare the yearly market price and price support payment of various commodities over a period of years.

Apply basic mathematical skills to maintaining accurate records of supervised occupational experience programs.

Solve problems related to individual student interests and needs in all of the four fundamental mathematical processes.

Compute interest, depreciation, taxes and discounts with problems relating to student's need and interest.

Compute the yield, value of product, cost of production for crops and livestock enterprises.

Compare costs of doing business through a cooperative with other businesses.

Measure the volume of various agriculture storage structures.

Carry out a cash transaction making correct change.

Analyze several businesses from the standpoint of goods and services handled, sources of materials functions, principal markets, and other basic functions.

Develop and maintain a good set of business records for supervised work experience programs.

Prepare a report analyzing several businesses in the community.

Compare the credit policies of two or more local businesses.

Secure an employment certificate, social security, and income tax forms and complete as necessary.

Sample Performance Objectives

The student will be able to take and test a soil sample to determine acidity or alkalinity.

Given a pH kit, the student will be able to perform with 90 percent accuracy a pH test on three soil samples.

Given a specific area of land, the student will take the proper number of soil samples using correct sampling procedure.

The student will be able to propagate plants by seed and vegetatively.

Given the proper planing medium, tools and containers, the student will propagate with 90 percent success a minimum of:

1. 2 flats of seedlings
2. 2 flats of cuttings
3. Graft 10 fruit trees
4. 5 pots of bulbs

Given the local concentrate feeds available and their protein content and price, the student will design with the Pearson Square Method, a concentrate mix with (a) fixed stated protein content, (b) cheapest ration for a fixed protein content, and (c) finishing ration for beef steers.

Course Titles and Descriptions

All courses will include classroom instruction combined with laboratory, leadership, and Future Farmers of America (FFA) activities. Supervised Occupational Experience Programs (SOEP) in the form of on-farm projects, cooperative work experience in agriculture, and supervised laboratory experience will be an integral part of each course.

VOCATIONAL AGRICULTURE I (9th Grade)

Animal Science: Introduction to beef, sheep and swine production.

Plant Science: Introduction to crop/horticulture production.

Agriculture Mechanics: Tractor operation/safety, shop safety, tool ID, basic skills, introduction to arc welding, tool fitting, tap and die, small wood projects.

Agriculture Economics: Project record books.

Leadership Development: Introduction to FFA and beginning parliamentary procedure.

VOCATIONAL AGRICULTURE II

Animal Science: Animal nutrition, livestock skills and livestock selection.

Plant Science: Forage and cereal crop production, horticulture, fertilizers.

Soil Science: Soil evaluation, soil texture, structure, slope, drainage, and pH.

Agri-Mechanics: Safety, fencing, advanced welding, oxyacetylene welding, cutting and brazing, tillage and seedbed equipment operation, maintenance and repair.

Agri-Economics: Recordkeeping, summarizing year end records.

Leadership Development: Public speaking, advanced parliamentary procedure.

VOCATIONAL AGRICULTURE III

Animal Science: Genetics and breeding programs, A.I., health, sanitation and disease, and meats.

Plant Science: Range management, grass seed, nursery, and Christmas tree production, landscaping.

Agri-Mechanics: Electric wiring and motors, plumbing, nonferrous welding, metal identification, tractor and equipment preventive maintenance, harvesting equipment.

Agri-Economics: Records.

Leadership Development: Informative speaking.

VOCATIONAL AGRICULTURE IV

Animal Science: Production records, management systems.

Plant Science: Irrigation, pesticides safety and application.

Agri-Mechanics: Farmstead layout, machinery management, building construction.

Agri-Economics: Farm taxes, ag financing, cooperatives, marketing.

Leadership Development: Persuasive speaking, job interviews.

HORTICULTURE I and/or II

Advanced horticulture/nursery skills in plant propagation, fertilizer, disease/insect control, marketing.

AGRICULTURE MECHANICS

Advanced agriculture mechanics skills in agricultural equipment, repair, and maintenance. Construction skills, advanced welding, chain saws and materials. Project construction time is available.

* *

Minimum Agriculture Vocational Cluster Approval Criteria

In addition to specific cluster criteria, state-approved vocational programs shall meet the criteria for approval of all secondary vocational education instruction as listed in the Handbook of Policies and Procedures for Vocational Education Instruction in Oregon Secondary Schools, 1985.

Criteria outline:

- Four-year high school: 4 credits (130 hours per credit) offered or,
- Three-year high school: 3 credits (130 hours per credit) offered:
  - 1 credit each year
- Instructional time blocks of sufficient duration for skill development to meet industry standards.
- Program goals, course goals and instructional content which reflect those in the state cluster brief.
- Supervised Occupational Experience (SOE) is an integral part of the instructional program with a minimum 200 hours of labor for calendar year.
- Vocationally certified teacher.
- An active, representative occupational advisory committee.
- Future Farmers of America (FFA) as an integral part of the instructional program.

* *

Organizational Options

There are many acceptable options for delivery of instructional content while assuring that a quality program is provided. Schools have the opportunity to schedule classroom and laboratory activities to accommodate students and to facilitate learning. Delivery options include after school, weekends, summer school or alternate days.

BASIC PROGRAM - 4-year High School

9th Grade	10th Grade	11th Grade	12th Grade
Voc Agri I	Voc Agri II	Voc Agri III	Voc Agri IV
1 Credit	1 Credit	1-2 Credits	1 Credit

BASIC PROGRAM - 3-year High School (condensed 4-year curriculum)

10th Grade	11th Grade	12th Grade
Voc Agri I	Voc Agri III	Voc Agri IV
1 Credit	1-2 Credits	1 Credit

BASIC PROGRAM with options (1 or more)

9th Grade	10th Grade	11th Grade	12th Grade
Voc Agri I	Voc Agri II	Voc Agri III	Voc Agri IV
1 Credit	1 Credit	1 Credit	1 Credit

Option courses as supplement to basic program--not substitute.

Horticulture I 1 Credit	Horticulture II 1 Credit
Agri-Mechanics I 1 Credit	Agri-Mechanics II 1 Credit

SMALL SCHOOLS OPTION

9th Grade	10th Grade	11th and 12th Grades
Voc Agri I	Voc Agri II	Voc Agri III or IV
1 Credit	1 Credit	1 Credit, offered with alternate year curriculum

If you need technical assistance, call the Occupational Program Specialist at the Department of Education. The specialist's name and phone number appear on the first page of this document.

ah/0009v
101584

528181984645